

## 9. ALL INDIA COORDINATED COTTON IMPROVEMENT PROJECT

### Crop Improvement

#### National Trials

- Ten National trials with an objective of improvement of *G. hirsutum* and *desi* varieties and intra *hirsutum* interspecific and *desi* hybrids were conducted during the year 2007-08.
- In the initial evaluation trial of *G. hirsutum* genotypes P 57-6 recorded the highest yield in both North and South Zones. BS 279 and GISV 218 were promising in both Central and South Zones. Under rainfed situation, TSH 9975 was promising in Central and South Zones.
- Among the conventional intra *hirsutum* hybrids, ARBHH 51 in North and Central Zones, NSPL 423 and RAHH 255 in Central and South Zones were promising. Under rainfed situation, DHH 0761 was promising in both Central and South Zones.
- Among the interspecific (*G. hirsutum* x *G. barbadense*) hybrids JKCHB 216 was promising in both Central and South Zones.
- Among the *G. arboreum* varieties, LD 937, FDK 118 and CASA 294 were promising under North Zone conditions under rainfed situations. AKA 0110 and CINA 347 in Central Zone and DLSa 1004 and RAAS 8 in South Zone were promising.
- In the *desi* hybrid trial, FMDH 8 was promising in North and South Zone. In Central Zone, JKCDH 505 recorded the highest yield. Raj DH 279 was promising in both Central and South Zones.

#### North Zone Trials

- Bihani 161 and H 1300 and LH 2111 were the promising *G. hirsutum* varieties in the varietal trial.
- Among the intra *hirsutum* hybrids, SAHIB 274 and SVHH 139 were promising.
- In the Coordinated varietal trial, *G. arboreum* genotypes CISA 614 recorded the highest yield followed by FKD 124.
- Among the *desi* hybrids, FMDH 7 and KR 64 were superior to the check varieties.

#### Central Zone Trials

- In the *G. hirsutum* varietal trial, varieties GSHV 01/1338, CNH 012 and TCH 1705 under irrigated conditions and GSHV 01/26, KH 155 and NH 630 under rainfed situations were promising.
- Among the *G. arboreum* genotypes, GAM 67, GAM 141 and JLA 1799 were promising.
- Among the intra *hirsutum* hybrids, ARCHH 8188, GGCH 70 and Tulasi 27 under irrigated conditions and PMCH 99, MLCH 318 and DHH 66 under Rainfed conditions were promising.
- Among the interspecific hybrids JKCHB 214 (H x B hybrid) and GGCH 81 (*desi* hybrid) were promising.

#### South Zone Trials

- *G. hirsutum* genotypes ARBH 813 and RAH 216 were promising in the Co-ordinated irrigated Varietal trial. *G. arboreum* genotypes KWA 2-3 and DLSa 102 were superior to the zonal and local checks in seed cotton yield and fibre quality.
- Intra *hirsutum* hybrids KDCHH 712, ARCHH 9770, JKCH 2245 and SSB3 were promising under irrigated conditions.
- Inter specific (*G. hirsutum* x *G. barbadense*) hybrid JKCHB 215 and PSCHB 901 were superior to the check hybrid DCH 32 in seed cotton yield and fibre strength.
- Among the *desi* hybrids KR 32, GGCH 81 and NACH 12 were promising.
- Among the *G. herbaceum* genotypes DDhc 1001 was superior to the check variety Jayadhar.

### Crop Production

- Integrated weed control practice viz., Pendimethalin @ 1.0 kg a.i./ha pre-emergence + hand weeding at 30 and 60 DAS followed by Fluchloralin @ 1.00 kg a.i./ha pre + Quizalofop-ethyl @ 0.05 kg a.i./ha at 30 and 60 DAS are effective weed control technology at Surat.
- At Rahuri and Lam, although higher yield was realized with the farmers' practice (HW at 20, 40 &



60 DAS and again interculture at 45 & 90 DAS), yet Pendimethalin / Fluchloralin + Quizalofop-ethyl at the above dose and time was economical and effective. At Dharwad, Pendimethalin @ 1.5 kg a.i./ha pre + Quizalofop-ethyl @ 0.05 kg a.i./ha at 30 and 60 DAS+HW at 45 DAS was seen the best.

- Application of recommended dose of NPK along with FYM @ 10 t/ha at Khandwa, and that (RDF) with 5 t FYM produced highest seed cotton yield at Siruguppa.
- Foliar feeding of  $MgSO_4$  @ 1.0 % +  $ZnSO_4$  @ 0.5% improved the seed cotton yield at all the locations in comparison to individual micronutrient sprays including that in control.
- Full dose of MOP at sowing at Sriganganagar and two sprays of 3%  $KNO_3$  at Kanpur resulted in realizing significantly higher seed cotton yield.
- Three sprays of 3%  $KNO_3$  gave significantly higher seed cotton yield at Banswara, Surat, Junagarh and Siruguppa where as four sprays of 2%  $KNO_3$  and four sprays of 3%  $KNO_3$  showed its superiority at Nanded and Indore, respectively.
- A combined application of N, P, K, S and Zn yielded higher over the rest of the treatments at Sriganganagar.
- A combination of INM components viz., FYM @ 5 t/ha, green manuring of *dhaincha in situ*, Azotobactor, Azospirillum and PSB (seed treatment) to cotton is the best under cotton-chickpea crop sequence at Rahuri.
- In a fertigation trial, higher seed cotton yield was realized with the application of 125% N and K applied as 10% basal + 90% from 30-120 days in 9 splits (1802 kg/ha) followed by 125% N and K applied as 10% basal + 90% from 30-120 days in 6 splits. Quality parameters were not influenced by different fertigation treatments except strength which was higher.
- Application of 60 kg N /ha, 40 kg S/ha and vermicompost @ 1.25 t/ha, Azospirillum and PSB was effective in cotton under rainfed condition at Indore.
- Seed cotton yield was significantly higher with recommended plant protection measures than with bio-pesticides only at Khandwa, Rahuri and

Nanded.

- Higher seed cotton yield (1882 kg/ha) was obtained by detopping at 65 DAS as compared to the control (1495 kg/ha) at Khandwa.
- Highest seed cotton yield of 1593 kg/ha was recorded with single row 80% ET but it was at par with single row 60% ET, paired row 80% ET and paired row surface method at Nandyal.
- Application of Mercaptethyl amine has been found to increase seed cotton yield.
- Seed cotton yield and quality obtained under early planted condition was significantly higher over that in late planted situation.
- Foliar spray of  $CaCl_2$  0.25% +  $KNO_3$  0.5% sprayed at peak flowering and boll development stages (twice) was shown to increase the yield significantly over control and was supported by observations on biophysical parameters like photosynthesis, stomatal conductance, transpiration rate, leaf temperature and relative water content.

## Crop protection

### Entomology

- Cultures tolerant to jassid and bollworms were identified from breeder's material from three cotton growing zones of India.
- In North Zone, among the sucking pests, jassid alone severe in Ludhiana, while other sucking pests were very low in all the centres. Spotted bollworm was at moderate level (1.4 to 5.1/ 5 plants) and pink bollworm was high (2.2 to 7.0/ 20 green bolls) in Sriganganagar, while *Heliothis* and pink bollworm were almost nil in all the centres.
- Except Nanded all the centres in Central zone recorded moderately higher level of jassid population, 6.3 to 18.7/ 3 leaves in Banswara, 6.2 to 15.4 in Surat and 6.8 to 10.9 in Rahuri. Nanded recorded higher population of thrips (36 to 90 / 3 leaves) followed by Rahuri (30 to 39). Junagadh recorded higher population of whitefly (39 to 62 / 3 leaves), while it was very low in other centres.
- Spotted bollworm was at moderate level in Khandwa (2.1 to 5.9 / 5 plants), Bhawanipatna (5.0 to 9.2) and Akola (3.5 to 10.5). Very high population of pink bollworm recorded in Akola (7.3 to 45.3 / 20

green bolls) followed by Khandwa (1.7 to 8.3), Rahuri (2 to 10), while it was almost nil in other centres.

- In South zone, Dharwad recorded higher population of aphid (34 to 128 / 3 leaves), Jassid (6.1 to 7.8) and thrips (30 to 56), while all other centres recorded very low population of sucking pests.
- Mealybug which was originally considered as minor pest emerged as a major key pest and poses severe threat to cotton crop. Mealybug was found almost in all the centres of the three zones. Low temperature and high humidity favours the build up of pest. Discarding the uprooted infested plants, unnoticed infestation in the border rows, weed host and extended duration of cotton crop with irrigation and fertilizer, unfavourable abiotic factors etc. helped faster development and spread of the pest.
- New insecticides BYI 08330, SYN 13623 and spinosad at 187.5 ml were effective against sucking pests and recorded higher yield 55.8, 55.2 and 48.5 per cent, respectively over check.
- The treatments spirotetramat and spirotetramat + imidacloprid were found effective against mealy bug and recorded significantly higher yield of 11.78 and 10.59 q/ha as compared to 6.08 q/ha in control.
- Spinosad and Bt cotton treatments were effective against bollworms and recorded 46.0 and 39.0% higher yield over control, respectively.
- Adoption of IPM with Bt cotton hybrids revealed an increase of 12.7 % net returns viz., Rs. 37,097/ha as compared to Rs. 32,911/ha in non IPM with the same Bt hybrids.

#### Plant pathology

- Cotton Leaf Curl Disease (CLCuD) continued to be the major disease of the North Zone States of Punjab, Haryana and Rajasthan affecting both Bt and non Bt cotton crops with the disease intensity varying from traces to 100 per cent in Punjab and traces to 80 per cent in Haryana and Rajasthan.
- High incidence of Alternaria leaf spot (ALS) was observed in Maharashtra (up to 24.66%), Karnataka (40.00%) and late in the season in Tamil Nadu (85.62%).
- Grey Mildew (GM) was the important disease of cotton in Maharashtra (Max 63.33%), Karnataka (30.00%) and Andhra Pradesh (19.00%).
- Myrothecium leaf spot (MLS) was an important disease in Madhya Pradesh recording a maximum incidence of 34.00%.
- Bacterial leaf blight (BLB) was a major disease in Gujarat (Max. 30.00%), Madhya Pradesh (36.00%), Maharashtra (55.00%) and Andhra Pradesh (26.00%).
- Ten entries from various screening trials have been found resistant to Cotton Leaf Curl Disease.
- The test fungicide, Taqat 75 W.P., was effective at both doses viz. 500 and 750 g/ha of formulation and on par with the standard fungicide, Propiconazole @ 0.1% in significantly reducing the incidences of alternaria leaf spot in Faridkot, Junagadh and Dharwad and of Myrothecium and Cercospora leaf spots in Faridkot. Taqat @ 750 g/ha gave better control than Propiconazole against grey mildew in Dharwad.
- The test bactericide, Copper Hydroxide 46.1 % DF @1000, 1250 and 1500 g/ha of the product significantly reduced bacterial leaf blight incidence and on par with the standard Copper oxychloride plus streptomycin. Highest concentration of the product gave the maximum control of the disease. It was also effective against Alternaria leaf spot.
- Seed treatment with the talc formulation of *Pseudomonas fluorescens* Pf 1 @ 10 g/kg seed followed by foliar spray of the same on 30, 40, 50, 60, 70, 80 and 90 DAS has once again proved effective in reducing the incidences of alternaria leaf spot and grey mildew.
- Spraying of Carbendazim @ 0.1% against grey mildew and Propiconazole @ 0.1% against alternaria leaf spot on 50, 65, 80 and 95 DAS gave maximum control of the diseases. An yield loss of 16 per cent in seed cotton occurred due to grey mildew when no prophylactic measure was taken up.
- Similarly spraying of Propiconazole (0.1%) against Myrothecium leaf spot and Streptomycin (100 ppm) plus Copper oxychloride (0.3%) against Bacterial Leaf Blight on 35, 50, 65, 80 and 90 DAS gave maximum control of the diseases and averted yield losses respectively of 26.8 per cent and 39.3 per cent.

## Front Line Demonstration in Cotton

During the year 2007-08, 1400 Front Line Demonstrations (FLDs) on Cotton Production Technology, 24 unit demonstrations on cotton Integrated Pest Management (IPM) and 22 unit demonstrations on Farm Implements were conducted all over India under the aegis of All India Coordinated Cotton Improvement Project with supervision by Dr.N.Gopalakrishnan, Project Coordinator ( Cotton Improvement) and Head, CICR Regional Station, Coimbatore.

### North Zone

#### Punjab Agricultural University, Faridkot

The technologies demonstrated under cotton production technologies were improved cotton varieties / hybrids MRC 6304 Bt, RCH 314 Bt, RCH 134 Bt, MRC 6301 Bt, PAU 626 H and JK 1947, optimal plant population, time of sowing, weed control and balanced nutrition. In all the demonstrations, the demonstrated hybrids / varieties recorded higher seed cotton yield than the respective checks. It was observed that there was 10-50% per cent increase in the mean yield of Bt hybrids compared to respective check hybrids. Demonstration on cotton IPM was conducted in an area of 50 hectares in 12 different units using the PAU - IPM module. Overall, there was 16.3% increase in seed cotton yield due to IPM demonstrations. Demonstrations on farm implements *viz.*, disc harrow, aero blast sprayer and rotavator were conducted in an area of 48 hectares. Also, hybrid cotton planter and disc harrow were demonstrated in an area of 18.4 hectares.

#### Haryana Agricultural University, Hisar

The technologies demonstrated under cotton production technology were yield maximization of cotton varieties / hybrids AAH 1, HD 123, HD 324, H 1117 and H 1226. The average range of yield increase in these improved varieties and hybrids was between 10 to 12 %. One unit of demonstration on cotton IPM was carried out on farmers' fields of Hisar district. Deep ploughing, selection of variety, seed treatment, balanced use of fertilizer, regular monitoring of pest, spray at ETL level, proper dose of pesticide and water were adopted in the IPM demonstration. Highest seed cotton yield (2190 kg/ha) was obtained in the

demonstration field of Shri. Prem Singh S/o Chalu Ram of Village Dhiranwas. In IPM trials, 10.78 per cent higher seed cotton yield was recorded as compared to the local farmers' practices. To demonstrate implements like Sub soiler for deep ploughing and Rotavator for hoeing one unit of demonstration was conducted in the Village Shahpur Begu of Sirsa district. It was observed that Shri. Ramdev S/o Nanak Ram picked (1570 kg/ha) seed cotton yield against (1350 kg/ha) local check. On average basis, seed cotton yield in Farm implements trials was 10% higher than farmers' practices.

#### Rajasthan Agricultural University, Sriganganagar

Front line demonstrations were conducted during *Kharif* season of 2007 on different farmers' fields of Sriganganagar and Hanumangarh districts. *G. hirsutum* Bt hybrids RCH-134, MRC-6029, MRC-6304, Variety RS-810, RST-9 *G. arborium* hybrid Raj DH 9, AAH-1, CICR-2 and variety RG-8 were demonstrated as against local cultivars Bikaneri nerma, RST-9 and F-846. Improved varieties / hybrids recorded an average of 21.53% higher seed cotton yield than local cultivars. One unit of demonstration was conducted on cotton IPM. During the season 4 and 6 sprays were given to the crop raised under IPM and non-IPM, respectively. The average seed cotton yield was recorded at 20.30 q/ha in IPM as compared 18.50 q/ha of non-IPM. Considering the total income and expenditure incurred on IPM and N-IPM fields, IPM led to more profit (1:2.63) than farmers practice (N-IPM)(1:2.15).

#### MPUAT, Banswara

The technologies demonstrated under production technology were improved varieties / hybrids H 8 and PA 255. One unit of demonstration was conducted on IPM with the techniques *viz.*, Deep summer ploughing, seed treatment, Okra as trap crop, hand picking of early shoot borer damage, use of pheromone traps and use of neem products. Under the demonstration on farm implements, the implements like Rotary tiller, ridger plough, power weeder, power sprayer, local improved weeder, wheel hoe and tractor mounted high capacity sprayer were demonstrated.

#### Central Institute for Cotton Research, Sirsa

The newly released cotton hybrid CICR 2, variety CISA 310, intra-*hirsutum* hybrid CSHH 198 and hybrid seed production of CICR 2 and CSHH 198 were

the cotton production technologies demonstrated during the year. One unit of demonstration on cotton IPM with the technologies viz., deep ploughing after harvest of the wheat, FYM or decomposed compost application, recommended fertilizers application, resistant /Bt hybrid/variety against insect- pest and diseases, use of pheromone traps, application of pest management interventions based on pest surveillance and Economic Threshold Levels (ETL) and use of plant products and bio-agents were demonstrated. The average yield obtained in IPM and non-IPM plots of Bt cotton hybrids was 28 q and 25.5 q/ha as but it was 23 and 22 q/ha in IPM and non-IPM plots of varieties. The net profit gained per hectare was Rs.55750 and Rs. 46767 in IPM and non-IPM plots of hybrids along with C:B ratio of 1:5.58 and 1:4.10.

#### **Central Zone**

##### **Navsari Agricultural University, Surat**

During the year 2007-08, seventy five demonstrations on cotton production technology, two units demonstration on cotton IPM and one unit demonstration on farm implements were conducted by NAU, Surat. The improved varieties/ hybrids demonstrated were G.Cot Hy 12, G.Cot Hy 10, G.Cot 23, G.Cot 21, approved Bt cotton hybrids, balanced nutrition and correct spacing.

##### **Junagadh Agricultural University, Junagadh**

Fifty demonstrations on cotton production technologies, one unit demonstration on cotton IPM and one unit demonstration on farm implements were conducted by JAU, Junagadh during the year 2007-08. The varieties / hybrids demonstrated were Vikram 5, Ankur -9, Alto 377, Gopal, Rasi-sai. Parash Brahma, MRCH 6301, RCH 2, RCH 2BG II, Mallika, Vijai 1, Tulsi 117, RCH 118 (Sai), Ajita 155, Mallika 207, MRC 7301, Ganesh 205, Parash bramha, Dolarmaruti (441 BG II), Bunny 245, MRC 7351, Gold 50, Narmada 145, Deviraj, intercropping with greengram, groundnut and urad bean, alternate furrow irrigation and skipping DAP application. Results of varietal FLDs indicated 9.60 per cent average yield increase over check with a range of 2.33 to 50.00 per cent. Demonstration on IPM saved an average of five pesticides sprays.

##### **J.N. Krishi Vishwa Vidyalaya, Khandwa**

Thirty three demonstrations conducted on Integrated

Nutrient Management in cotton produced on an average 29.29 q/ha seed cotton as compared to 25.95 q from the farmer's practices. Seven front line demonstrations were conducted on intercropping pigeon pea with cotton in the ratio of 4:2 rows, respectively. The results indicated that intercropping of pigeon pea with cotton recorded monetary returns in the range of Rs 76130 - 48200/-per hectare and the average returns were Rs 61515/-per hectare. The sole crop of Bt cotton recorded maximum monetary returns of Rs 66250/- while minimum was Rs 42500/- per hectare.

##### **J.N. Krishi Vishwa Vidyalaya, Indore**

JNKVV, Indore had conducted forty demonstrations on cotton production technology and one unit demonstration on farm implements. The technologies demonstrated under production technology were improved cotton varieties / hybrids viz., VICH 05, VICH 15, VICH 09, MRC 6301 Bt, DCH 32, JK 35, Phule 358, IH 63, intercropping with maize (2:1) ratio and Integrated Nutrient Management. Results indicated that the improved varieties / hybrids recorded on an average 12.4% to 25.3% higher yield over farmer's practices. Intercropping system of Cotton + Maize 2:1 row ratio was found more remunerative by Rs. 12620/ha to Rs. 15910/ha more income as compared to sole crop of Cotton/Farmer's practices. The INM practices in cotton recorded an average range of 13.8 % to 27.0 % higher yield over application of chemical fertilizer/farmers' practices. IPM demonstrations recorded 19.5% to 30.2 % higher yield as compared to farmer's practices/pest management through chemicals.

##### **PDKV, Akola**

One hundred and twenty demonstrations on cotton production technology, two unit demonstrations on cotton IPM and one unit demonstration on farm implements were conducted by PDKV, Akola. Improved varieties / hybrids, soil management, *in situ* soil moisture conservation, crop canopy management, clean cotton pickings, organic cotton production and plant spacing were the technologies demonstrated.

##### **MAU, Nanded**

One hundred and twenty demonstrations on cotton production technology, two unit demonstrations on cotton IPM and one unit demonstration on farm implements were conducted by MAU, Nanded.



Improved *desi* cotton varieties, plant population, INM, strip cropping of red gram (6:2), intercropping of green gram (1:1), spraying of micro nutrients, rain water management techniques, spraying of urea and DAP at 45 and 75 DAS and application of organic manures were the technologies demonstrated.

#### **MPKV, Rahuri**

The centre had conducted fifty demonstrations on cotton production technology, one unit demonstration on cotton IPM and one unit demonstration on farm implements. Intercropping, improved varieties and hybrids, INM and IDM were the technologies demonstrated under the programme.

#### **OUAT, Bhawanipatna**

One hundred and fifty demonstrations on cotton production technology, one unit of demonstration on cotton IPM and one unit of demonstration on farm implements were conducted by OUAT, Bhawanipatna. Integrated cotton management practices *viz.*, application of 12 cart loads of FYM, supply of arhar seeds for inter-cropping, fertilizer application based on soil test report, use of tricho cards, pheromone traps and HaNPV, foliar spray of NAA at flowering period, foliar spray of DAP at boll formation stage and clean picking were demonstrated. The FLD farmers obtained gross return of Rs.35,111/- for a lower cost of cultivation of Rs.11,938/- as compared to Rs.29,618/- for an investment of Rs.12,538/- in the farmer's own practice. The cotton equivalent yield advantage was 21.4 per cent in the demonstrated plots compared to the farmers practice. The return per rupee invested was 2.9 in the production technology plots and 2.4 in the farmers' plots.

#### **CICR, Nagpur**

Cotton based technologies - INM, inter cropping with soybean, opening of ridges and furrows for moisture conservation, foliar application of nitrogen along with Magnesium sulphate, Zinc sulphate and Borax and detopping for management of reddening of cotton leaf disorder, *G. arboreum* cultivar Turab, *G. hirsutum* cultivar NH 615 and IPM in conventional hybrid NHH 44 and Bt hybrid NCS 145 were demonstrated on farmers fields of 145 adopted farmers of Atmuddi, Belgaon and Jalka villages in Warora Taluka of Chandrapur District and Khairi, Kosara, Sukali

and Takali villages of Yeotmal district. An average seed cotton yield 1071 kg/ha was recorded with the various demonstrated technologies as against 937 kg/ha with the farmers practice. An increase in seed cotton yield ranged from 11.67 to 42.80 per cent with an average of 14.30 per cent. Spraying with power sprayer and battery operated sprayer was also demonstrated and latter showed better efficiency had lower spray drift, covered more surface area and provided finer spray droplets. Use of cotton stalk slasher was demonstrated for residue management through soil incorporation.

#### **South Zone**

##### **ANGRAU, Guntur**

The centre had conducted seventy five demonstrations on cotton production technology, two unit demonstrations on cotton IPM and two unit demonstrations on farm implements. Performance of Bt hybrids with improved technologies *viz.*, high yielding Bt hybrids, modified scheduled of fertilizer application (at 30, 50, 70 DAS), foliar application of micronutrients (boron @ 0.1% and Mgso<sub>4</sub> @1% at 60, 90 DAS) and foliar application of multi 'K' at 60, 90 and 110 DAS were demonstrated as against farmers' practices. FLD plots recorded an average of 39.2 q/ha with net returns of Rs.54068/ha and B: C ratio of 1.7. Under farmers' practice, the productivity was reduced by 5.2 q/ha with net returns of Rs.43059/ha with B:C ratio 1.35. Under IPM demonstration, IPM components like seed treatment with imidacloprid, stem application of Monocrotophos, (1:4) - sowing of intercrop of redgram, jowar and maize as guard crops, installation of pheromone traps for monitoring of *Spodoptera*, erection of bird perches, application NSKE thrice during the crop period and need based application of pesticides when the pest was noticed above ETL were demonstrated as against the farmers' practices. By adopting IPM practices, farmers were benefited with higher yield of 36.3 q/ha and Rs. 50102/ as returns as against farmers' practice of 33.2 q/ha with Rs. 41013 returns. Farmers were benefited with an additional income of Rs 0.45 for every rupee spent in IPM when compared with non IPM. Under demonstration on farm implements, cotton stalks were incorporated in the field itself with rotavator. This

practice reduced the labour cost on removal of cotton stalks after pickings and also added organic matter to the soil which improved physical properties of soil. Use of Taiwan sprayer has improved the effectiveness of spray fluid by higher atomization and uniform coverage. Besides the area covered in a day of six working hours has increased by reducing the cost per unit area (ha) to an extent of Rs 700/- over seven sprayings in a crop season.

#### **CRIDA, Hyderabad**

The centre had conducted one hundred demonstrations on cotton production technology and one unit demonstration on cotton IPM. The technologies demonstrated were Bunny Bt, Mallika Bt, PCH 2171 Bt, deep summer ploughing, crop rotation, avoiding crop rationing, certified seeds, acid de-linting, seed treatment, timely sowings, weed management, intercrops, removal of crop residues, topping and pest management practices. The APAU-IPM module was used for demonstrations on cotton IPM.

#### **UAS, Dharwad**

Seventy five demonstrations on cotton production technology, two unit demonstrations on cotton IPM and two unit demonstrations on farm implements were conducted by UAS, Dharwad. The varieties /hybrids demonstrated were Interspecific hybrids viz., DHB-105 v/s DCH-32, RAHB-87 v/s DCH-32, DHB - 290 v/s DCH-32, Inter *hirsutum* hybrids viz., DHH - 11 v/s DHH-543, *Hirsutum* /*Arboreum* varieties viz., Sahana v/s DLSa-17 and *herbaceum* varieties viz., DDhc-11 v/s Jayadhar. The other technologies demonstrated were intercropping in cotton (Cotton + beans (1:1)) v/s Sole cotton, 25% N, K and full dose P as basal dose, 50% N and K at 30 DAS and 25% N and K at 60 DAS v/s RDF or Farmers practice, INM, leaf reddening management and Integrated Crop Management. An increase of about 15-30% in the seed cotton yield was obtained due to replacement of old hybrids / varieties with newly released genotypes. The implements demonstrated were Self propelled cotton stalk slasher-with 5 HP diesel engine, cotton stalk shredder with 10 HP motor, Grass cutter/ cotton stalk cutter with 2-extra blades, Cloy gin (Modified), Lilliput gin (4-5 kg capacity), Brahma bullock drawn sprayer, Taiwan

sprayer with Konabsu engine (AP Agro. Industries) HTP-Power sprayer and Agrimate- Electric sprayer (Knapsack).

#### **TNAU, Coimbatore**

The centre had conducted seventy five demonstrations on cotton production technology, one unit demonstration on cotton IPM and two unit demonstrations on farm implements. The imposed components in Adoptable Srivilliputtur IPM (ASIPM) module with the technologies basal application of neem cake @150 kg/ha, seed treatment with *Pseudomonas fluorescens* @ 10 g/kg, soil application of *Pseudomonas fluorescens* @ 1 kg/acre, sowing in ridges and furrows, acid delinting of cotton fuzzy seeds with 100 ml of Sulphuric acid per kg of seeds, drenching with 1% neem oil at 20 DAS, trap crops castor and sunflower, eco-feast crops- Maize and cowpea, installation of pheromone and yellow sticky traps, clipping of terminals at 75DAS and need based application of safer insecticides was demonstrated under IPM demonstrations. The yield in ASIPM based FLD plots, ranged from 1099 to 1638 kg/ha, whereas under farmers' plant protection practices the yield varied between 774 and 1001 kg/ha. The B:C ratio ranged from 1.92 to 2.58 under IPM demonstrations. Under non-IPM, it ranged from 1.05 to 1.40.

#### **CICR, Regional Station, Coimbatore**

Twenty five demonstrations on cotton production technology, one unit demonstration each in cotton IPM and farm implements were conducted by CICR, Regional Station, Coimbatore. The technologies demonstrated under production technology were improved cotton varieties Surabhi and Sumangala, Bt cotton hybrids RCH 2Bt and RCH 20 Bt, ELS cotton hybrids DCH 32 and RCH 708Bt, INM, Intercropping with vegetables and Integrated Weed Management. Demonstrations on improved varieties and Bt cotton hybrids increased the seed cotton yield to the maximum of 50 per cent. The IPM module developed by CICR, Coimbatore was adopted for IPM demonstration. Demonstrations on IPM reduced the number of sprays from six to three. Bullock drawn ridger and junior hoe were demonstrated under farm implements. It reduced the cost of weeding to the extent of Rs. 4350/- per hectare.